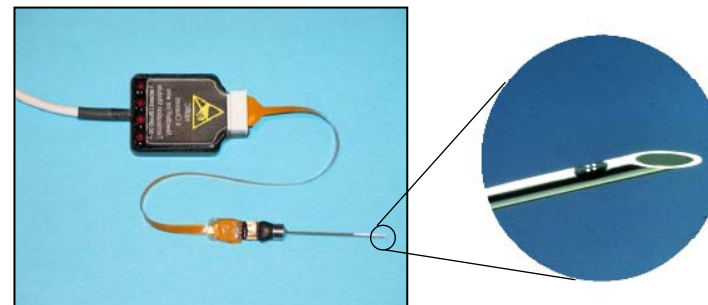
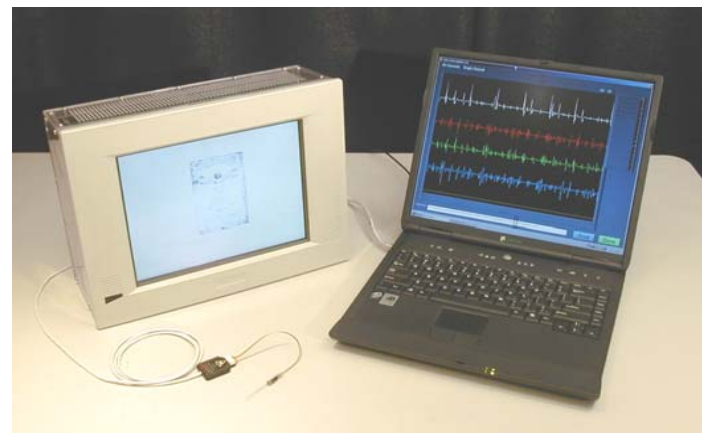
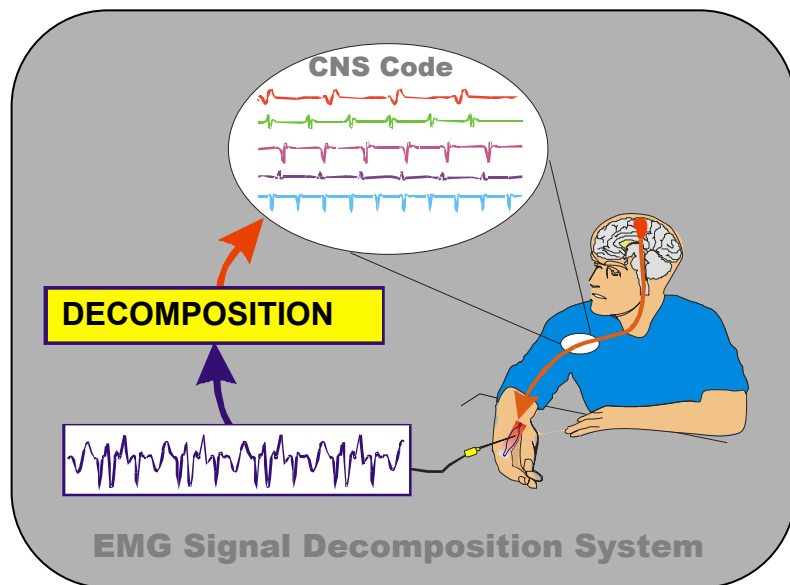
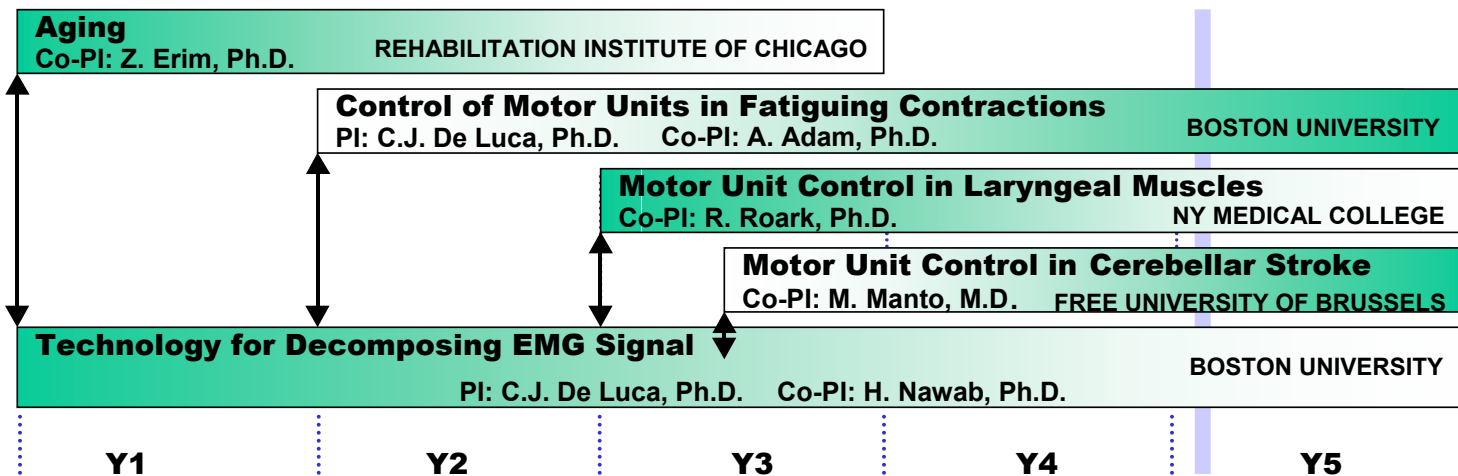


# TITLE: HARNESSING MOTONEURON ACTIVITY: FROM LABORATORY TO CLINIC

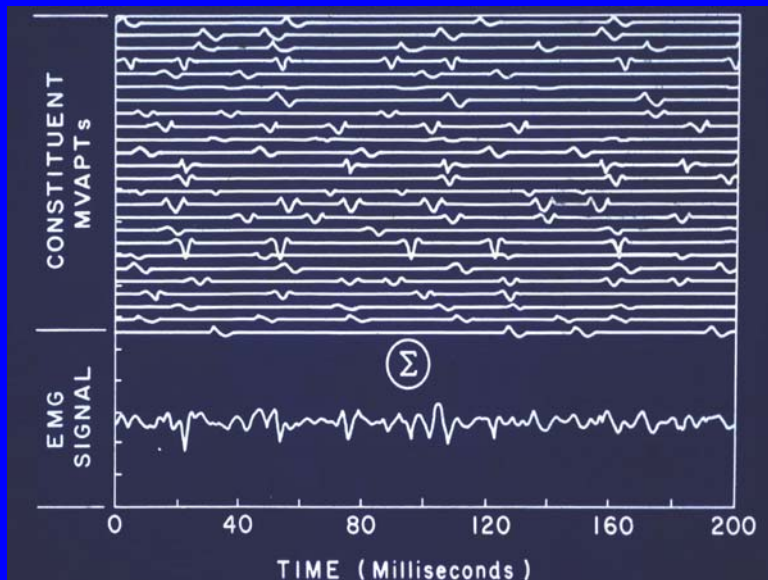
PI: Carlo J. De Luca, Ph.D.



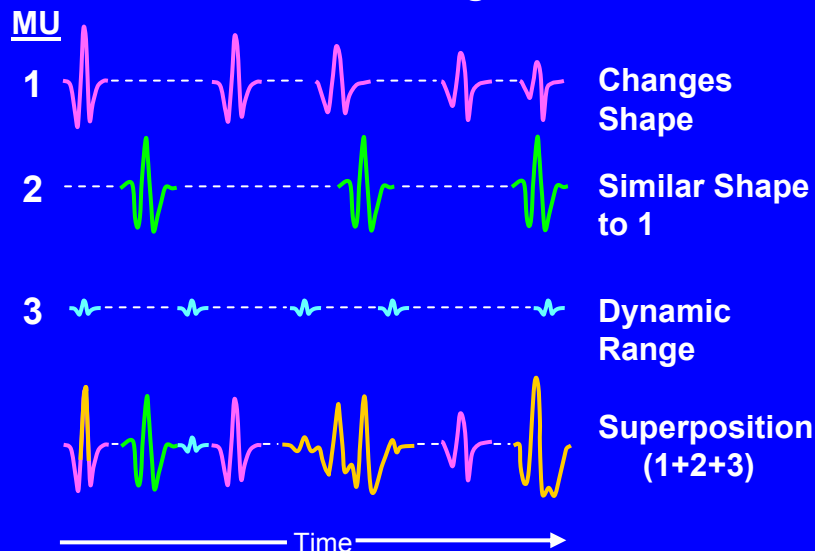
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## Task



## Challenges



## Solution

### Signal Conditioning

Filtering to improve SNR

### Signal Segmentation

Detection of MUAPs.

### MAP Receiver with Template Updating

Shape filtering & initial classification

- Slow evolution of MUAP shapes
- Shape discrimination between different MUAPs
- Resolution of simple superpositions

### Trellis Traversal Procedure

Repair of broken trains

- Addresses abrupt evolution of MUAP shapes

### Statistical Utility Maximization Procedure

Repair of missed firings

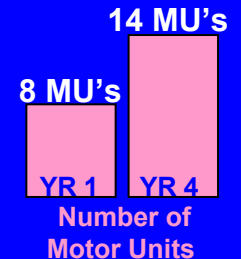
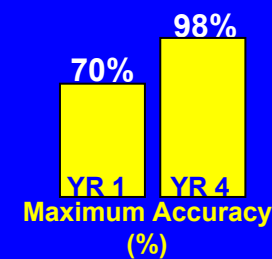
- Resolution of challenging superpositions
- Detection and classification of low amplitude MUAPs

### Statistical Edge Processing Procedure

Determine first & last firings for each MUAP train

- Addresses abrupt shape evolution in edge regions

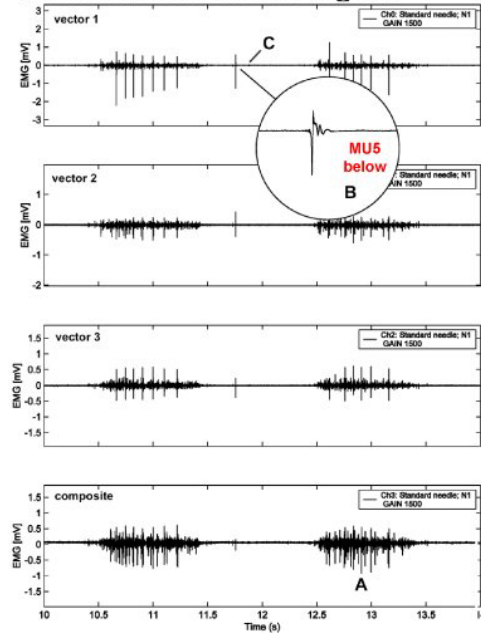
## Performance



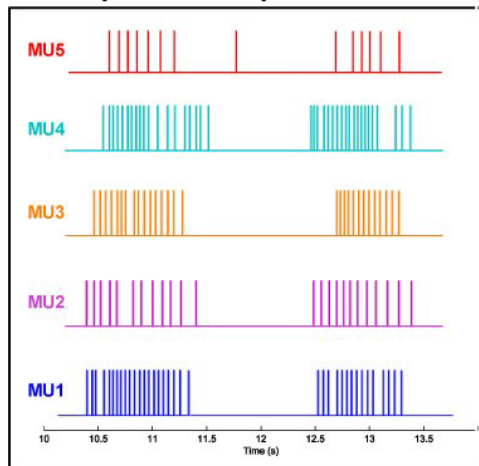
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## Quadrifilar needle EMG signals



## Decomposition bar plot



## Laryngeal EMG



## Cerebellar Stroke

